

# EPA Site Visit, October 9 - 10, 2002

## Nonpoint Source Management Program



Goal 3 of the Nonpoint Source Program's Outreach Strategy calls for "Increased program visibility with legislative (state, federal) and funding agencies".

In line with this objective, the Nonpoint Source Management (NPS) program organized a two-day tour of Maryland NPS projects for United States Environmental Protection Agency (EPA) personnel. This tour was designed to give the visitors an opportunity to acquaint themselves with the program and to provide insights on a variety of Maryland's NPS issues (planning, implementation, etc.) in both rural and urban watersheds

EPA officials involved in this tour include Fred Suffian, Peter Weber, Tom Ivori, Romell Nandi and Stacie Craddock. The tour gave EPA officials an opportunity to see first hand on the ground implementation projects, meet and network with state NPS staff and project managers and become acquainted with local implementation issues and concerns.



### Projects Visited During This Tour

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#### Urban Watershed Projects:

1. Town Of University Park Stream Restoration Project.
2. Low Impact Development Tour including a visit to Presidential Heights Low Impact Development Project.

#### Rural Watershed Projects:

1. Upper Pocomoke Agricultural BMP Evaluation Project.
2. Worcester County Wetlands Tour



## **Town Of University Park – Town Park Stream Restoration Project:**

This site tour was led by the Honorable John L. Brunner (Mayor, Town of University Park). He explained the importance of this project to the town by portraying the innovative partnerships involved its realization.

The Town of University Park Stream revitalization project successfully restored 3,500 linear feet of stream that suffered from bank erosion, silting, degraded habitat and an almost complete lack of riparian forest buffers. This project highlights how effective stream revitalization and habitat rehabilitation work can be accomplished in a highly urbanized environment. The stream revitalization project was made possible through a private/public partnership that included financing from the Town of University Park, Home Depot (which needed mitigation construction done nearby), and the Environmental Protection Agency's Clean Water Act "319" funding through DNR. Prince Georges County Department of Environmental Resources (DER), The University of Maryland, and University Park Elementary also contributed to the project.



**EPA and DNR Officials view stream**



**Before Stream Restoration**



**Immediately After Stream Restoration**

## **Low Impact Development Tour:**

In a very well articulated presentation, Larry Coffman (of Prince Georges County, Department of Environmental Resources), a lead Low Impact Development (LID) practitioner in the state, led a tour that portrayed various LID techniques implemented within Prince Georges (PG) County. The following sites were visited during the LID tour;

- Northwestern High School, Hyattsville, Maryland (bioretention facilities)
- Adelphi Road Median Strip (bioretention facilities)
- Mary Harris "Mother" Jones Elementary School
- PG County DER Office building (bioretention facility)
- Presidential Heights LID Project.

### **What is Low Impact Development?**

In LID, the design approach is to leave as many undisturbed areas as practical to reduce runoff volume and runoff rates by maximizing infiltration capacity. This functional landscape emulates predevelopment temporary storage (detention) and infiltration (retention) functions of the site.



Bioretention facilities are intended to function in much the same way the hydrological cycle occurs in the natural environment. The physical, chemical and biological processes that occur in nature are reproduced in the application of LID technologies.

### 1. Northwestern High School Bioretention facilities

Located in Hyattsville, this site contains a total of 14 bioretention areas, which cover a combined area of 0.35 acres. The different facilities treat total of 10.18 acres.

This project also has an educational value by virtue of its existence on the premises of a high school and also its proximity to the University of Maryland. As part of an ongoing cooperative research program between Prince Georges County, DER and the University of Maryland, this site underwent testing this year for runoff characteristics. These facilities are also used as sites for field work for students of this high school.



### 2. Adelphi Road Median Strip

Prince George's County Department of Public Works and Transportation incorporated LID within the median strip of Adelphi Road by constructing several bioretention facilities.



The bioretention facilities, 600 feet in length, were designed to treat highway runoff. Before the construction of the facilities, runoff would enter storm drain inlets without quantity and quality controls before discharging into the local streams.

### 3. PG County DER Office building (bioretention facility)



Built in 1998, these two bioretention facilities are located within the parking lot of the Inglewood Center III building in Largo, Maryland. They continue to function and perform as intended to treat parking lot runoff.



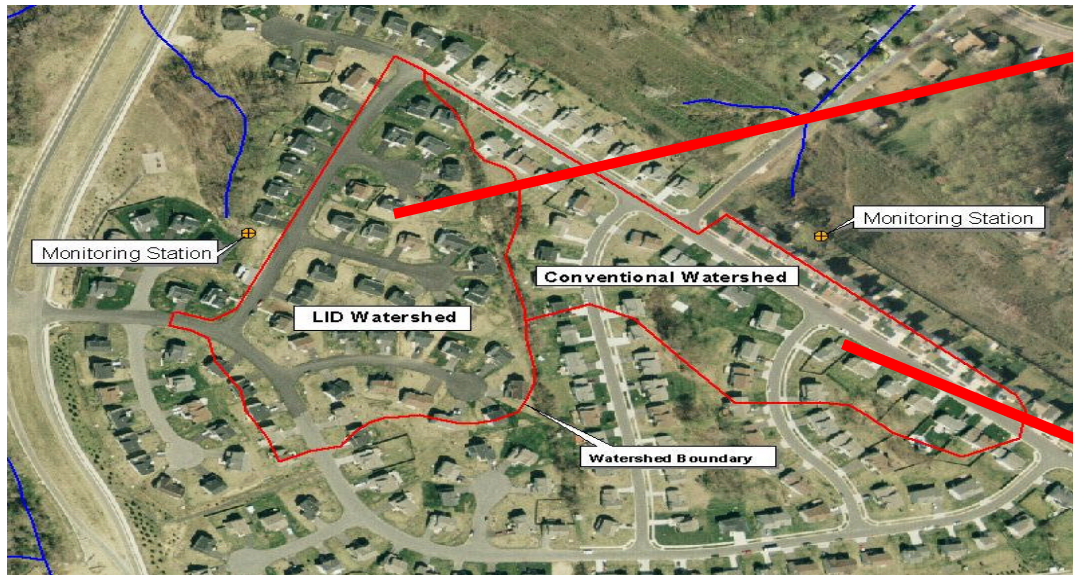
Larry Coffman of PG County, DER (far left) explains the design and functioning of this bioretention facility to visiting EPA and DNR officials.

In the construction of these facilities, the original ground within this island was excavated approximately 3.5 feet and included a 6" perforated PVC pipe underdrain which outfalls into an existing storm drain inlet. The excavated material was replaced with a soil medium that contained 30% leaf compost, 70% sand, and less than 5% clay by volume.

The entire drainage area of this parking lot is impervious and the bioretention facilities capture polluted runoff from the parking lot. As runoff slows and ponds within the bioretention area, suspended solids, salts, hydrocarbons, heavy metals are filtered and removed from the stormwater runoff. Evapotranspiration, infiltration and assimilation by plants and soil ecosystem processes help remove pollutants contained in the stormwater runoff.

#### 4. Presidential Heights Low Impact Development Project

Extensive studies have been carried out at this site to study the differences between conventional development and LID. This project sought to demonstrate 1.) the effectiveness of the LID concepts in maintaining post-development stormwater quantity and quality near predevelopment conditions and 2.) the effectiveness of LID concepts for retrofitting residential communities thereby providing opportunities for restoring watershed quality. Results from Physical, chemical and biological monitoring lends additional technical support of the effectiveness of the LID concepts.



The left side of the subdivision was developed using Low Impact Development (LID) technologies including impervious areas disconnection, Raingardens, grass swales, and bioretention basins.

The right side of the subdivision has been developed using conventional approaches.



With LID, the absence of traditional street curbs and other stormwater conveyances allow for "sheet flow" which can result in better absorption during rains as opposed to traditional streets with stormwater channeling, which can contribute to erosion.



"Rain Gardens" are bioretention facilities present on each lot to allow for rainwater to be captured and treated. Residents assert that the presence of rain gardens adds value to their property because trees, shrubs and other vegetation within such areas have an aesthetic value.



## Upper Pocomoke Agricultural BMP Evaluation Project

This is a cooperative project between the Wicomico Soil Conservation District (SCD), Maryland Department of Natural Resources and the United States Geological Survey (USGS). The Pocomoke River is one of four major tributaries of the Chesapeake Bay on the Eastern Shore of Maryland. Agriculture and related industries are the foundation of the economy in this rural watershed where cash grain and poultry operations account for 90% of the farms. The goal of this paired watershed study is to demonstrate the effects of nutrient management and poultry litter management on water quality. The study design involves a control watershed and a treatment watershed. The control watershed is a 2342 acre watershed on the North Fork of Green Run. Fifty eight percent of the watershed is cropland and 42% woodland. The annual broiler capacity is approximately 3,493,000. The 1,779 acre treatment watershed is located on the South Fork of Green Run. The treatment watershed is 54% cropland and 46% woodland, with an annual broiler capacity of 1,400,000.

The treatment period began in 1998. The program consists of complete poultry litter removal from the treatment watershed and replacement with inorganic fertilizer, in compliance with nutrient management planning, and cover crops on all available acres.

### **Preliminary Findings**

Nutrient budgets developed from 1998 to 2001 indicate that nutrient surplus in the control watershed has remained constant while nutrient surpluses in the treatment watershed have decreased approximately 92% for nitrogen and approximately 98% for Phosphorous.

## Worcester County Wetland Site Tour

The Worcester County Soil Conservation District, in cooperation with the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), Maryland Department of Natural Resources and local landowners, completed the restoration of over one hundred acres of wetlands and associated buffers in the Pocomoke and St. Martins River watersheds. The District used Nonpoint Source Program and Transportation Equity **Act 21<sup>st</sup>** Century (TEA-21) funds administered by DNR's Watershed Restoration Division. These efforts created forested wetlands on a variety of locations capable of supporting a wide range of reptiles, amphibians, migratory waterfowl and other fauna associated with wetlands and wetland habitats.



The wetland creation projects range in size from three acres to nearly forty acres. Several wetland sites were constructed in areas previously served by Public Drainage Associations. Such wetland restoration projects will have a strong local impact on reducing nutrients and improving wildlife habitat within the Pocomoke and St. Martin River watersheds.



John McCoy Of DNR (left) explains project design and preliminary findings.



Leading this part of the tour were Bruce E. Nichols, (second from right) NRCS District Conservationist for the Worcester Field Service Center, and Mitch Keiler of DNR's Watershed Restoration Division (center left).